IN THE CLAIMS

The following is a complete listing of the claims, and replaces all earlier versions and listings.

1. (Currently Amended) A method of vacuum and pollution-free arsenic extraction, ~~involves the following steps in turn~~ comprising:

(1) ~~Load the~~ loading a material comprising arsenic concentrate and iron powder into [[the]] a smelting chamber;

(2) ~~Increase~~ increasing the temperature of the smelting chamber to 100°C-300°C and ~~then hold the~~ holding that temperature to remove [[the]] vapor and a small quantity of dust [[in]] from the material;

(3) ~~Under~~ increasing, under residual pressure ≤ 50Pa, ~~increase~~ the temperature of the smelting chamber and the temperature of a crystallization chamber to 300-500°C and ~~then hold the~~ holding the increased temperatures to remove [[the]] volatilized arsenic sulfides [[in]] from the material;

(4) ~~Hold~~ holding the temperature of the crystallization chamber at 300-500°C, ~~increase~~ and increasing the temperature of the smelting chamber to 500-600°C and ~~then hold the~~ holding that temperature to remove [[the]] decomposed gaseous element sulfur ~~decomposed~~ from the material;

(5) ~~Increase~~ increasing the temperature of the smelting chamber to 600-760°C and ~~then hold the~~ holding that temperature, ~~meanwhile lower~~ while lowering the temperature of the crystallization chamber to 270-370°C and ~~then hold the~~ holding that temperature to ~~let the~~ allow arsenic vapor generated from the material to crystallize in the crystallization chamber

and ~~get element~~ obtain arsenic; and

(6) ~~Lower~~ lowering the temperatures of the smelting chamber and the crystallization chamber to below 150°C, ~~charge the~~ charging air into an air charging valve, and, when [[the]] inside and outside air pressures are ~~basically~~ approximately equal, [[strip]] stripping the arsenic and conducting deslagging;

2. (Currently Amended) A method of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 1, ~~featuring that~~ further comprising the step of crushing, before the material is charged into the ~~above mentioned~~ smelting chamber, ~~there is a step to crush~~ the arsenic concentrate material into a grain size of 0.1mm-2mm.

3. (Currently Amended) A method of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 1, ~~featuring that~~ in which the weight of ~~above mentioned~~ iron powder is 2-4% of arsenic concentrate material.

4. (Currently Amended) A method of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 1, ~~featuring that~~ in which the temperature of the smelting chamber in step (2) is held for a holding time [[is]] of 1-2 hours ~~in the above step (2)~~.

5. (Currently Amended) A method of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 1, ~~featuring that~~ in which the temperature of the smelting chamber and the temperature of the crystallization chamber in step (3) are held for a holding time [[is]] of 1-2 hours ~~in the above step (3)~~.

6. (Currently Amended) A method of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 1, ~~featuring that~~ in which the temperature of the crystallization chamber and the temperature of the smelting chamber in step (4) are held for a holding time [[is]] of 1-3 hours ~~in the above step (4)~~.

7. (Currently Amended) A method of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 1, ~~featuring that~~ in which the temperature of the smelting chamber and the temperature of the crystallization chamber in step (5) are held for a holding time of ~~smelting chamber and crystallization chamber is respectively~~ 3-7 hours ~~in the above step (5)~~.

8. (Currently Amended) A method of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 1, ~~featuring that~~ in which the temperature of the smelting chamber in ~~the above mentioned~~ step (2) is 200-300°C.

9. (Currently Amended) A method of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 8, ~~featuring that~~ in which the temperature of the smelting chamber in the ~~above mentioned~~ step (2) is 250-300°C.

10. (Currently Amended) A method of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 1, ~~featuring that~~ in which the temperature of the smelting chamber in ~~the above mentioned~~ step (3) is 450-500°C.

11. (Currently Amended) A method of vacuum and pollution-free arsenic extraction as

~~mentioned~~ in Claim 1, ~~featuring that~~ in which the temperature of the crystallization chamber in ~~the above mentioned~~ step (3) is 400-450°C.

12. (Currently Amended) A method of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 1, ~~featuring that~~ in which the temperature of the smelting chamber in ~~the~~ ~~above mentioned~~ step (4) is 550-600°C.

13. (Currently Amended) A method of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 1, ~~featuring that~~ in which the temperature of the crystallization chamber in ~~the above mentioned~~ step (4) is 400-450°C.

14. (Currently Amended) A method of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 1, ~~featuring that~~ in which the temperature of the smelting chamber in ~~the~~ ~~above mentioned~~ step (5) is 650-750°C.

15. (Currently Amended) A method of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 14, ~~featuring that~~ in which the temperature of the smelting chamber in ~~the above mentioned~~ step (5) is 700-750°C.

16. (Currently Amended) A method of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 1, ~~featuring that~~ in which the temperature of the crystallization chamber in ~~the above mentioned~~ step (5) is 300-360°C.

17. (Currently Amended) A system of vacuum and pollution-free arsenic extraction, ~~its feature lies in inclusion of induction heating equipment, smelting device, constant temperature crystallization device, automatic deslagging device, dust collection device, automatic temperature control device, vacuum measuring device, and vacuum extraction device. The above mentioned~~ comprising:

a smelting device;

a constant temperature crystallization device, [[is]] fixed on the ~~above mentioned~~ smelting device through a demountable device, wherein an [[.]] ~~Its~~ interior smelting chamber of the smelting device is connected ~~with the~~ to a crystallization chamber of the ~~above mentioned~~ constant temperature crystallization device[[.]] so that arsenic vapor generated from ore concentrate in the smelting device can crystalize in the crystallization chamber and produce arsenic;

an automatic deslagging device, connected to a ~~Its~~ bottom of the smelting device ~~is connected with the above mentioned automatic deslagging device.~~ so as to conduct deslagging, wherein the ~~The above mentioned~~ smelting device, the constant temperature crystallization device, and the automatic deslagging device each have a vacuum sealing in between; [[.]]

a dust collection device, connected to the ~~The above mentioned~~ constant temperature crystallization device ~~is connected with the above mentioned dust collection device~~ through [[the]] a dust collection inlet pipe; [[.]]

a vacuum measuring device and a vacuum extraction device, the vacuum extraction device being ~~Such dust collection device is~~ connected ~~with the above mentioned vacuum extraction device~~ to the dust collection device through a pipe equipped with the vacuum measuring device to measure a system vacuum degree, so that arsenic sulfides volatilized

from the ore concentrate in the smelting device are drawn into the dust collection device through the crystallization device by the vacuum extraction device; ~~Inductor~~

induction ~~on the above mentioned induction~~ heating equipment, having an inductor [[is]] arranged on the ~~above mentioned~~ smelting device, [[.]] so as to heat the smelting device and the crystallization device to predetermined temperatures; and ~~The~~

an automatic temperature control device, having thermal couples ~~of above mentioned automatic temperature control device are~~ respectively mounted on the ~~above mentioned~~ smelting device and on the constant temperature crystallization device, so as to control the temperatures of the both devices.

18. (Currently Amended) A system of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 17, ~~featuring that~~ wherein the ~~above mentioned~~ smelting device ~~consists of~~ comprises:

a crucible formed by a detachable bottom [[(8')]], a cover, [[(26)]] and a wall; [[(8),]]

a vacuum furnace shell [[(7)]] assembled outside the crucible; and ~~, as well as~~

a hollow collecting and exhaust pipe [[(9)]] vertically mounted at [[the]] a center of the ~~above mentioned~~ crucible bottom, [[(8').]]

wherein

[[The]] an interior wall of the ~~above mentioned~~ crucible and an exterior wall of the ~~above mentioned~~ collecting and exhaust pipe [[(9)]] form the ~~above mentioned~~ smelting chamber, which connects [[with]] to the ~~above mentioned~~ crystallization chamber through [[the]] a top of the ~~above mentioned~~ collecting and exhaust pipe, ~~(9). Many~~

a plurality of downward slant holes are distributed on [[the]] a wall of [[such]] the collecting and exhaust pipe, and ~~(9). A~~

a vapor drainage pipe [[(1)]] is also installed under [[such]] the collecting and exhaust pipe [[(9)]], which crosses the ~~above mentioned~~ crucible bottom [[(8')]] and connects with an exhaust fan.

19. (Currently Amended) A system of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 18, ~~featuring that the~~ wherein a centerline of each slant hole of the ~~above mentioned~~ collecting and exhaust pipe [[(9)]] and [[the]] a centerline of the ~~above mentioned~~ collecting and exhaust pipe [[(9)]] are in the same plane and form a 20-40 degree bevel with [[the]] a lower end face of the ~~above mentioned~~ collecting and exhaust pipe [[(9)]].

20. (Currently Amended) A system of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 18, ~~featuring that~~ wherein the ~~above mentioned~~ crucible is made of corrosion proof and heat conducting material.

21. (Currently Amended) A system of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 20, ~~featuring that~~ wherein the ~~above mentioned~~ crucible is made of graphite.

22. (Currently Amended) A system of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 18, ~~featuring that~~ wherein the inductor of the ~~above mentioned~~ induction heating equipment is [[of]] an intermediate frequency inductor, and ~~. Such~~ the intermediate frequency inductor is in an integral cast in the insulating materials and is assembled in the vacuum furnace shell [[(7)]] outside the above mentioned crucible, ~~. The above mentioned~~ the induction heating equipment also ~~includes~~ including intermediate frequency power, a

capacitor for an electric induction heating system, and an intermediate frequency isolating transformer, ~~. The above mentioned~~ the intermediate frequency isolating transformer [[is]] being connected between [[the]] an electric input end of the ~~above mentioned~~ intermediate frequency inductor and the intermediate frequency power.

23. (Currently Amended) A system of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 18, ~~featuring that~~ wherein the inductor of the ~~above mentioned~~ induction heating equipment is [[of]] an intermediate frequency inductor and the ~~. Such~~ inductor is assembled outside the ~~above mentioned~~ vacuum furnace shell, ~~(7). The~~ the ~~above mentioned~~ induction heating equipment also ~~includes~~ including intermediate frequency power and a capacitor for an electric induction heating system.

24. (Currently Amended) A system of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 23, ~~featuring that~~ wherein the ~~above mentioned~~ vacuum furnace shell [[(7)]] is made of a high temperature resistant, ~~insulation~~ insulating, non-magnetoconductive, ~~non-conducting~~ non-conducting, and non-leakage material.

25. (Currently Amended) A system of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 24, ~~featuring that~~ wherein the ~~above mentioned~~ vacuum furnace shell [[(7)]] is made of ceramic or 4-fluorothene plastic wire mesh.

26. (Currently Amended) A system of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 23, ~~featuring that~~ wherein insulating material is used to block [[the]] a gap between the ~~above mentioned~~ crucible wall [[(8)]] and the ~~above mentioned~~ vacuum

furnace shell [[(7)]].

27. (Currently Amended) A system of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 17, ~~featuring that~~ wherein the ~~above mentioned~~ constant temperature crystallization device ~~includes~~ comprises:

a bottomless shell; [[(14)]]

[[and]] an inner shell; [[(13),]]

[[many]] a plurality of multi-hole crystallization plates [[(15)]] installed on one support; and

~~as well as~~ a center heating pipe [[(16)]] installed on the ~~above mentioned~~ bottomless shell [[(14)]] and extending at [[the]] a vertical direction in [[the]] a center of the shell,

wherein a ~~. The~~ space in the ~~above mentioned~~ inner shell [[13]] forms the ~~above mentioned~~ crystallization chamber, ~~. The above mentioned~~ and the inner shell [[(13)]] and a support of the multi-hole crystallization plate [[(15)]] are fixed together with the ~~above mentioned~~ bottomless shell [[(14)]] through [[the]] a dismountable device.

28. (Currently Amended) A system of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 27, ~~featuring that~~ wherein a [[minor]] small annular slit exists between the bottomless shell [[(14)]] and the inner shell [[(13)]] of the ~~above mentioned~~ constant temperature crystallization device, and ~~. The~~ a bottom of the ~~above mentioned~~ annular slit is plugged with refractory materials.

29. (Currently Amended) A system of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 17, ~~featuring that~~ wherein the ~~above mentioned~~ automatic temperature

control device ~~includes~~ comprises:

a thermal couple [[(5)]] inserted on [[the]] a crystallization chamber shell [[(14)]] for measuring temperature in the crystallization chamber; [[,]]

a thermal ~~couples (5)~~ couple inserted at [[the]] a furnace bottom for measuring the temperature of the smelting chamber; and

~~, as well as~~ a temperature controller connected [[with]] to the ~~above two~~ thermal couples [[(5)]] and the ~~above mentioned~~ induction heating equipment through a compensation cord for respectively controlling the temperature in the furnace and the crystallization chamber.

30. (Currently Amended) A system of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 17, ~~featuring that~~ wherein

the ~~above mentioned~~ smelting device is installed above [[the]] ground through a support,

the ~~(24). Such~~ smelting device ~~also includes~~ further comprises a furnace bottom [[(6)]] fixed to a ~~with the above mentioned~~ crucible bottom, and [[(8');]]

the ~~above mentioned~~ automatic deslagging device ~~includes:~~ comprises a hopper [[(4)]], a slag car, and a [[(3)]] ~~as well as~~ hydraulic lift [[(2)]] installed on the hopper, in which a ~~. The~~ ~~above mentioned~~ furnace bottom [[(6)]] is connected [[with]] to a vacuum furnace shell [[(7)]] through a top support of [[the]] a hydraulic lift (2), between which [[the]] vacuum sealing strips are used for vacuum sealing, and, ~~. Upon~~ upon lowering, [[such]] the hydraulic lift [[(2)]] can separate the ~~above mentioned~~ furnace bottom [[(6)]] and the ~~above mentioned~~ crucible bottom [[(8')]] from ~~the above mentioned~~ a crucible wall [[(8)]].

31. (Currently Amended) A system of vacuum and pollution-free arsenic extraction as ~~mentioned~~ in Claim 30, ~~featuring that~~ wherein a layer of heat insulation material is arranged between the ~~above mentioned~~ crucible bottom [[(8')]] and the ~~above mentioned~~ furnace bottom [[(6)]].